

MUNOFS VI Research Report

Forum: Special Conference on Water (MDG 7c)

Issue: Measures to improve access to potable water in LEDCs

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Introduction

The importance of potable water cannot be underestimated. Of course, there are the direct implications on rudimentary health and survival. The body is estimated to be about 60 to 70% water, with water being essential for key biological functions such as transporting oxygen and homeostasis – virtually every metabolic process in the human body. (“Pure New You”.) Evidently, its availability is crucial. However, an arguably neglected part of access to potable water is attention to its quality; at any one time half the world’s hospital beds are occupied by patients suffering from water-borne diseases – from cholera to dysentery. (Guinness, Paul.)

These physiological consequences of inadequate access to potable water also have repercussions that span over economic and social development. A 2% decrease in water in the body can trigger short-term memory loss, trouble with basic maths and jeopardize general productivity. (“Pure New You”.) 443 million school days are lost each year from water-related illnesses. Millions of women in LEDCs spend hours every day collecting water from unacceptably distant sources. (Shah, Anup.)

It should thus be no surprise that the United Nations established Target 7c as one of its Millennium Development Goals: halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation. Although the world as a whole has reached the target 5 years ahead of schedule, the alarming reality is that roughly 10% of the world’s population still don’t have access to potable water, with specific regions worldwide – namely LEDCs – not having reached the target and off-track in meeting the target in time. (“GOAL 7: ENSURE ENVIRONMENTAL SUSTAINABILITY”. *UN.org*.) Meanwhile, the pressure on water is building. The UN estimates that by 2025, 4 billion people will be affected by severe water stress, and the more afflicted areas will include the less economically developed areas in Africa, the Middle East and South Asia. (Guinness, Paul.) Certainly, access for the both the rural poor and marginalized slum-dwellers in urban areas remains a serious

concern.

Key Terms Defined

Access: Actual use by a population marked by an adequate amount of safe drinking water within a convenient distance from the user's dwelling. ("Charting the Progress of Populations". *UN.org*.) UNICEF further defines access in the context of potable water as "the source of the water is less than 1 kilometre away from the place where it will be used, and it is possible to obtain at least 20 litres per member of a household on a reliable basis". ("Overview | Water". *UNICEF WCARO*.)

Potable water: Water that is free from impurities, pollution and bacteria such that it is suitable for drinking. (Guinness, Paul.)

LEDCs: Less economically developed countries. This includes countries with relatively low levels of economic development compared to MEDCs (more economically developed countries). Characteristics include high birth, death and infant mortality rates (over 20, 30 and 50 per thousand respectively); more than 50% of the workforce in agricultures; and low levels of secondary schooling, literacy, electricity consumption per head and GDP per capita – generally below \$US 1000 per capita. (Mayhew, Susan.)

Improved potable water sources: Includes sources that, by nature of their construction or through active intervention, are protected from outside contamination, particularly faecal matter. It includes public taps, protected springs and rainwater collection. It does not include unprotected dug wells, surface water, tanker trucks and so on. ("Overview | Water". *UNICEF WCARO*.)

Water-stressed area: Place where water supply is below 1700 cubic metres per person per year (Guinness, Paul.)

Water-scarce area: Place where water supply is below 1000 cubic metres per person per year (Guinness, Paul.)

Groundwater: Water held beneath the earth's surface in porous soil/sediment/rock which is not combined chemically with any minerals present, originating from precipitation or melting ice (Guinness, Paul.)

Evapotranspiration: The combined processes of evaporation, sublimation and transpiration of the water from the Earth's surface into the atmosphere (Guinness, Paul.)

Aquifer: Permeable rock, gravel, or sand that will hold groundwater and permit its passage (Guinness,

Paul.)

Physical water scarcity: When physical access to water is limited due to an inadequate or an absent source of water (Guinness, Paul.)

Economic water scarcity: When there is not the necessary monetary means to utilize an adequate source of water. This can include income of individuals or when countries cannot finance the necessary infrastructure. (Guinness, Paul.)

Virtual water: The amount of water that is used to produce food or any other item (Guinness, Paul.)

Privatisation: To transfer from public or government control or ownership to private enterprise (“Privatisation.” *Collins English Dictionary – Complete & Unabridged 10th Edition*.)

Appropriate technology: A science or technology considered reasonable and suitable for a particular purpose that conforms to existing cultural, economic, environmental and social conditions (“Appropriate Technology.” *Dictionary.com’s 21st Century Lexicon*.)

General Overview of the Topic

The issue of improving access to potable water is two-fold. There is first the matter of the physical quantity of available water, and then the quality of the water being safe enough for drinking. The former is a question of the inherent hydrological cycle in a region and drawing access to the natural reserves of water. Physical water scarcity is heavily tied to climate, and this is the prominent issue in arid and semi-arid regions. Indeed, arid regions cover 40% of the world’s land area but receive only 2% of global precipitation. (Guinness, Paul.) These regions tend to rely on groundwater, but this is not sustainable, as illustrated by Yemen and Jordan withdrawing 30% more from groundwater resources than naturally replenished by the hydrological cycle. (Guinness, Paul.) Beijing and New Delhi are also depleting the water table in their own aquifers, which may result in saltwater intrusion, as occurred in the Mediterranean. (Guinness, Paul.) Delegates should also consider the imminent impacts of climate change. Indeed, coupled with human exploitation, the Yellow River is already drying up. There may be further decreases of water availability in East Africa, the Sahel and Southern Africa as rainfall declines and temperatures rise. (Guinness, Paul.) Nations need to consider how to best utilize the available water sources, which range from the heavily used groundwater to precipitation; surface water in rivers, streams and glaciers; the sea through desalination; ‘grey water’; and even biological sources such as plants –

particularly as hydrological conditions change.

And yet, the water crisis can be described as being of power, poverty and inequality rather than physical availability. (Shah, Anup.) Granted, with climate change and population growth this may change, particularly as raw demand grows and squatter settlements expand (and people are forced to scourge for objectionable water sources or face buying water from vendors at inflated prices). However, historically the inadequate access to potable water has been blamed on the unsuccessful commoditization and mismanagement of water. This raises the question of whether or not to privatize water, and also the issue of the role of state and improving on a municipal scale versus a grassroots approach. Fundamentally, there are also implied ties in with the first topic in the commission: is water a human right or a commodity?

There are also several perpetrators in the tainting of the quality of water. Contamination occurs by means of anything from fertilizers from farms, to industrial waste from factories, to untreated sewage from individuals. Transparency and accountability is therefore also something to explore, because the quality of water is certainly a major public health concern, particularly in causing fatal faecal-oral diseases. These typically cause diarrhoea and kill over a million children year. (Guinness, Paul.) That said, such diseases, like cholera and typhoid, can also be transmitted by contaminated food, fingers and utensils. (Guinness, Paul.) Thus arises the question: should money go towards increasing the supply of water at the same quality, or improving the quality of the existing supply?

The financing of improving access to potable water has been a contentious issue. Many have doubted the cost effectiveness of doing so, or have been daunted by the perceived costs of doing so. Drinking water receives a relatively low priority in official development assistance (ODA) and domestic allocations compared to other sectors like agriculture and education. ("Financing Water." *UN.org*.) However, reforms of a nation's infrastructure are only small aspect of the available measures that can be taken. Many decentralized approaches targeting communities in need have shown promising outcomes and boast a modest monetary cost. Furthermore, in calculating the cost of potable water provision, the other indirect and direct financial savings and gains must be considered: savings in health care, gains in productive days and school attendance, value of deaths averted and hence future earnings, and time savings from more convenient access giving rise to working days gained. The UN claims that an improvement of drinking water quality, if sustained, could lead to a benefit from \$US 5 to \$US 60 per \$US 1 invested. ("Financing Water." *UN.org*.)

These issues, though certainly important, are channelled towards deciding on measures to improve access to potable water. The actual measures themselves are briefly evaluated in the "Possible Solutions" section.

Major Parties Involved and Their Views

The circumstances encompassing the question of potable water are vast and diverse, with a range of climates, priorities and resources across the world. Views on the above issues raised are similarly infinite. There is no specific perpetrator nor guardian angel of a nation either. As such, there are no major parties in terms of specific countries; every nation has a role in this issue and has enacted its own measures to provide potable water to its population. It is also inappropriate to generalize Asia, Latin America, the Middle East or Africa – though granted it should be noted that these are the regions of which LEDCs form a subset, and where one may find most of the world's water-stressed and water-scarce nations.

That said, individual nations aside, there are some key organizations (besides the UN itself) which specialize in measures to improve the access to potable water.

World Water Council:

The World Water Council was established on the initiative of water specialized and international organizations. Its stated mission is to promote awareness, build political commitment and trigger action. Its values include transparency, democracy, dignity, independence (no special interests should interfere with the provision of potable water) and participation. (“Vision, Mission, Strategy”. *World Water Council*.)

The council holds a forum – the World Water Forum – periodically, of which has included a declaration that governments should have the primary role providing water access and laying out foundations for success (one tier of which states “supporting national plans with international aid”). (Shah, Anup.) The forum is supposed to serve as a platform “where the water community and policy- and decision-makers from all regions of the world can come together, debate and attempt to find solutions to achieve water security”. (“Vision, Mission, Strategy”. *World Water Council*.)

The council is financed through membership fees and Forum licensing fees, and additional support is provided by the host city of Marseille. Specific projects and programs are financed through grants and donations.

WaterAid:

WaterAid seeks to build water infrastructure while simultaneously giving skills to locals and working with local partners. They also seek to influence governments with their research and expertise, so water-stressed or water-scarce areas are not rendered reliant on them for technical or financial support. Their actions include getting villagers to construct their own hand-dug wells or hand pumps. They believe

governments should allocate more of their budget to their water sector due to its cost-effectiveness, and so also pressure governments based on this notion.

(“What We Do.” *WaterAid.org*.)

Timeline of Events

1890s Microbiologist Robert Koch identifies water supply filtration practices to be the reason for the low incidence of cholera in Altona, Germany. (Weise, James.)

1902 Belgium implements first continuous use of chlorine to produce potable water (Weise, James.)

1955 Infectious hepatitis epidemic infecting 1 million people in New Delhi, India is traced back to poorly chlorinated water (Weise, James.)

1968 Four year dysentery epidemic in Central America, killing over 20, 000 people and resulting in 500, 000 cases, begins (Weise, James.)

1977 The Mar del Plata United Nations Conference on Water – the first intergovernmental conference solely focused on water – takes place (“UN Watercourses Convention.” *WWF Global*.)

1981 The UN-declared International Drinking Water and Sanitation Decade begins and continues until 1990 (“The United Nations World Water Development Report.”)

21 July 1981 WaterAid is officially established (“What We Do.” *WaterAid.org*.)

1993 Bangladesh finds its main source of fresh water tainted with naturally occurring arsenic, affecting millions (“Financing Water.” *UN.org*.)

1996 World Water Council officially established (“Vision, Mission, Strategy”. *World Water Council*.)

March 1997 First World Water Forum held in Marrakech (“Vision, Mission, Strategy”. *World Water Council*.)

21 May 1997 Over 100 nations gather to adopt the UN Watercourses Convention, drafted by the UN to help conserve and manage water resources. As of 2013, only 30 ratifications have been achieved – 5 short of the number required for entry into force. (“UN Watercourses Convention.” *WWF Global*.)

2000 The Millennium Summit of the United Nations is held, and the UN Millennium Declaration is adopted by all 189 member states and 23 international organizations; the Millennium Development Goals are

officially set.

2003 UN-declared International Year of Freshwater

2005 The UN-declared International Decade for Action, 'Water for Life', begins and is to be continued until 2015. (Guinness, Paul.)

July-December 2007 A lack of clean drinking water in Iraq leads to an outbreak of cholera ("Drinking Water". *Wikipedia*.)

2009 The UN-Water Taskforce on wastewater management is established to emphasize the relevant issues, increase awareness of governments and to strengthen UN-system collaboration on activities pertaining to wastewater management. ("Financing Water." *UN.org*.)

September 2010 The UN-Water Thematic Priority Area on Water Quality is established ("Financing Water." *UN.org*.)

October 2010 A cholera outbreak starts from the upper Antimonite River in Haiti, killing nearly 7000 and affected half a million people. ("Drinking Water". *Wikipedia*.)

6 March 2012 The world meets the MDG of halving the proportion of people without sustainable access to potable water ("Millennium Development Goal Drinking Water Target Met." *WHO.int*.)

UN Involvement

As seen in the timeline, numerous efforts have been forged by the UN to improve access to potable water, and the meeting of MDG target 7c is a testament to the major role that has been played by the UN. In addition to the above and any associated resolutions pertaining to years or decades relating to water, one other resolution (Resolution 64/292) significantly relevant to this issue has been adopted.

Mar del Plata Action Plan of 1997

Adopted by the UN Water Conference, this recommended that "governments develop national plans and programmes for community water supply and sanitation". Priority and attention was to be given to milestones in the context of socio-economic development, the final disposal of wastewater and segments of the population in greatest need. ("Mar del Plata Action Plan on Water Development and Administration". *UN.org*.)

Resolution 55/196:

Adopted by the General Assembly on 20 December 2000, this resolution proclaimed the year 2003 as the International Year of Freshwater in light of Agenda 21 and other documents pertaining to sustainable development so as to further international cooperation, understanding and action given the importance of freshwater. (“55/196. International Year of Freshwater”. *Un-documents.net*.)

Resolution 58/217:

Adopted by the General Assembly on 23 December 2003, this resolution proclaimed 2005-2015 the International Decade for Action, “Water for Life”. It largely encouraged the greater prioritization and allocation of resources towards water-related issues in accordance with the respective MDG and Agenda 21, as well as other documents on sustainable development. (“58/217. International Decade for Action, “Water for Life”, 2005-2015”. *Un-documents.net*.)

Resolution 64/198:

Adopted by the General Assembly on 21 December 2009, this mainly served as a midterm review of the implementation of the International Decade for Action, “Water for Life”, and essentially was a reiteration of Resolution 58/217, a welcome of activities related to the decade and an encouragement for full involvement. (“Resolution 64/198”. *UN.org*.)

Resolution 64/292:

Adopted by the UN General Assembly on 28 July 2010, this resolution predominantly recognizes the human right to water and sanitation. The resolution calls upon States and international organizations to provide financial and technical support to LEDCs to protect safe, accessible and affordable drinking water (and sanitation). (“64/292. The Human Right to Water and Sanitation”. *UN.org*.)

Possible Solutions

There is no one-size-fits-all solution for all LEDCs. Numerous factors from political agenda to availability of water in time and space to a country’s human capacities need to be considered. That said, the plethora and diverse nature of the solutions available are promising.

1. Privatization of water

Again, this is controversial as it brings up the question of whether water is a commodity subject to market forces and private control, or if it is a basic human right and a virtually free entitlement.

It can be argued that privatisation will mean water will reach people in a more efficient manner when

specialized firms with expertise and full dedication to water take over. The World Bank and IMF have held this view, and also encouraged similar policies such as removal of subsidies for water provision. (Shah, Anup.)

Higher prices can also heighten accountability and thus deter wasting in domestic use, or encourage the systematic recycling of water in industry. The revenue generated can also be used to raise funds for more efficient technology and infrastructure. Governments can also maintain control through watchdog organizations. However, it remains a serious concern how this will affect accessibility to the poor (who may require assistance due to inability to pay) in LEDCs, who previously may not have had to pay for water at all before water sources were claimed by companies.

As a basic human need, water arguably should be the responsibility of governments, rather than private companies which may overlook fair pricing, water quality and customer complaints as they tend to be answerable to shareholders rather than the general public, and driven by profit. Not to mention, water provision's monopolistic nature raises similar concerns.

It is also been noted that LEDCs may feel pressured to privatize water management with favourable terms for private companies (including full guarantees in case of problems like bail out by tax payers). (Shah, Anup.)

2. Trading in virtual water

This can help save water in water-stressed or water-scarce countries as it means they can specialize in products that don't include water-intensive production and still receive products they aren't producing. More of their water resources can then be allocated towards domestic consumption, where it is needed most urgently. The size of global trade in virtual water is already more than 800 billion m³ a year. (Guinness, Paul.)

3. Legal framework and governance

This is related to the issue of the appropriate pricing of water, as raised in privatisation. However, the role of legal framework and governance greatly extends outwards to many other issues.

One such issue is pollution (which includes atmospheric input), contamination and illegal abstractions of water by affluent farmers and industries, such that the poor, rural and indigenous communities are limited in their access to potable water. These people also tend to have limited rights to natural resources. ("The World Water Development Report 2. *UNESCO.org*.) This is where accountability, transparency and

involvement of all shareholders is important. These values can help with fairer water policy and also help shrink corporate water footprints.

A legal framework may also have to be built towards individuals – the dumping of untreated domestic sewage is often a significant cause of contamination in smaller communities' water sources and can be deterred through legal means.

The water crisis has also been attributed to a crisis of governance. ("The United Nations World Water Development Report.") This includes a lack of adequate water institutions; fragmented institutional structure due to a sector-by-sector management approach and thus overlapping or conflicting decision-making; diversion of public resources for private gain; and unpredictability in the implementation of laws, regulations and licencing practices. In fact, 30% of water-related budgets are siphoned off by corruption, such as nepotism and manipulating meter readings. (Guinness, Paul.) Trust and efficiency can be thus be increased through strengthening and perhaps reforming governance using the above values, and measures such as decentralization, partnerships and new administrative systems.

4. Conserving

This ensures that the existing supply of water is consumed at a sustainable rate. In many places of the world, 40% or more of water is lost due to water leakages. ("The World Water Development Report 2. *UNESCO.org*.) In agriculture-intensive LEDCs, irrigation is also a major cause of diversion of water sources; most irrigation wastes half or more of water through evaporation, such as in flood irrigation. However, modern techniques, such as drip irrigation, are 95% efficient. (Guinness, Paul.) These tend to involve technology like sensors and so are relatively expensive in the beginning, but may constitute a worthy investment in the long run.

Other methods of conservation include canal lining, improved dam managements, awareness campaigns, volumetric water pricing, and reducing return flow in farming. (The World Water Development Report 3. *UNESCO.org*.)

5. Simple infrastructure and techniques

Water extracted directly from surface waters and open hand-dug wells still require treatment before deemed potable. It is important to keep the concept of appropriate technology in mind; many communities which lack access to potable water have an arguably localized problem and have limited resources – including electricity to power intricate purifying machines. Fortunately, many simple devices have been conceived, such as the LifeStraw, which uses nothing more than human-induced suction in a straw-like

instrument, and of which manufacturing costs are estimated at about \$US 3. Ceramic water filters are also more of a localized solution for household usage, and last 2-5 years, costing between \$US 10-12 to produce locally. (Williamson, Erin.) Simple sand filters are also similarly affordable and remove 99% of bacteria and most viruses.

PVC hand pumps are traditional and a simple solution for areas with groundwater. During the dry season, local wells can go dry. A supplementary source of water can thus be a rain harvesting tank, which holds 10, 000 litres, costs about \$US 700 and would serve 10 families indefinitely. (“Projects.” *Water for Life*.) Other appropriate technology includes deep wells and fog collection.

Even more affordable, albeit less reliable options, is to use solar water disinfection, or even heating water to a rolling boil. These can be easily implemented with raising awareness of the methods as they are virtually free. They kill biological agents such as worms and bacteria, but are limited in eliminating agents like toxic chemicals. (“SODIS: How Does It Work?” *SODIS*.) Viable chemical methods include chlorine disinfection and chemical flocculation – which can even include using table salt in conjunction with solar water disinfection.

These methods are only suitable for smaller communities however, as large demand could easily outstrip the supply due to the relatively small yields and productivity. However, they are good in that they can support local enterprise and are feasible. More large scale but sustainable methods are highlighted below.

6. Developing

River and wetland restoration are sustainable solutions in that they can restore the natural hydrological cycle. Other more advanced infrastructure and solutions which can provide for large populations include reservoir building, groundwater abstraction, cloud seeding, wastewater treatment facilities, distribution pipes and taps, and desalinization. (The World Water Development Report 3. *UNESCO.org*.) Desalinization is arguably the most radical as it is very promising in that there is a vast supply of seawater, but the monetary expense and costs on the environment are disconcerting. In all these, innovation and research may be required to increase their energy-efficiency and reduce costs. Developing and researching new solutions may also be a worthy investment given the changing hydrological cycles climate change may impose. The role of international organizations, notably the UN, should be highlighted in providing financial and technical support with their expertise, resources and platform for coordination.

The relevance of sanitation infrastructure should also be raised. If shared toilets or pit latrines could be more available in urban areas – notably in squatter settlements – urban dwellers may not resort to open

defecation and other contaminating practices as much.

7. Allocating

Allocation of existing resources can help indirectly conserve water and also can increase access towards those with limited access. This is where things like quotas, changing of crops and varieties of crops, and reallocation among sectors may be helpful. (The World Water Development Report 3. *UNESCO.org*.)

8. Reduce population and climate change

These are perhaps the most abstract and long-run solution, but as explained, high population growth and climate change are indeed contributors to limited access to potable water in LEDCs.

Works Cited

“Pure New You.” *Water & Health: Importance of Drinking Water*. 2013. Web. 17 July 2013.

Guinness, Paul. “Water and Change.” *Geography for the IB Diploma*. Cambridge: Cambridge UP, 2011. Print.

Shah, Anup. “Water and Development.” *Global Issues*. 6 June 2010. Web. 27 July 2013.

“GOAL 7: ENSURE ENVIRONMENTAL SUSTAINABILITY.” *UN.org*. UN Publications, n.d. Web. 6 Aug. 2013.

“Charting the Progress of Populations.” *UN.org*. UN Publications, n.d. Web. 6 Aug. 2013.

“Overview | Water.” *UNICEF WCARO*. Mar. 2010. Web. 8 Aug. 2013.

Mayhew, Susan. “LEDCs.” *Oxford Dictionary of Geography*. 2004. Print.

“Privatisation.” *Collin’s English Dictionary – Complete & Unabridged 10th Edition*. HarperCollins

Publishers. Web. 8 Aug. 2013

“Appropriate Technology.” *Dictionary.com’s 21st Century Lexicon*. Dictionary.com, LLC, n.d. Web. 8 Aug. 2013. <[http://dictionary.reference.com/browse/appropriate technology](http://dictionary.reference.com/browse/appropriate%20technology)>.

“Financing Water.” *UN.org*. UN Publications, n.d. Web. 10 Aug. 2013.
<<https://www.un.org/waterforlifedecade/financing.shtml>>.

“Vision, Mission, Strategy.” *World Water Council*. N.p., n.d. Web. 15 Aug. 2013.

“What We Do.” *WaterAid.org*. N.p., n.d. Web. 11 Aug. 2013.

Weise, James. “Historic Milestones in Drinking Water History.” *Dec.state.ak.us*. State of Alaska, n.d. Web. 12 Aug. 2013. <<http://www.dec.state.ak.us/eh/dw/publications/historic.html>>.

“UN Watercourses Convention.” *WWF Global*. N.p., n.d. Web. 12 Aug. 2013.

“The United Nations World Water Development Report.” *UNESCO.org*. UN Publications, 2003. Web. 13 Aug. 2013.

“Water Quality.” *UN.org*. UN Publications, n.d. Web. 13 Aug. 2013.

“Drinking Water.” *Wikipedia*. Wikimedia Foundation, 12 Aug. 2013. Web. 14 Aug. 2013.

“Millennium Development Goal Drinking Water Target Met.” *WHO.int*. N.p., 6 Mar. 2012. Web. 14 Aug. 2013.

“Mar Del Plata Action Plan on Water Development and Administration.” *UN.org*. UN Publications, n.d. Web. 15 Aug 2013.

“55/196. International Year of Freshwater.” *Un-documents.net*. N.p., 2000. Web. 15 Aug. 2013.
<<http://www.un-documents.net/a55r196.htm>>.

“58/217. International Decade for Action, “Water for Life”, 2005-2015.” *Un-documents.net*. N.p., 2003. Web. 15 Aug. 2013. <<http://www.un-documents.net/a58r217.htm>>.

“Resolution 64/198.” *UN.org*. UN Publications, 2010. Web. 15 Aug. 2013.

“64/292. The Human Right to Water and Sanitation.” *UN.org*. UN Publications, 2010. Web. 15 Aug.

2013.

“The World Water Development Report 2.” *UNESCO.org*. N.p., 2006. Web. 15 Aug. 2013.

“The World Water Development Report 3.” *UNESCO.org*. N.p., 2009. Web. 15 Aug. 2013.

Williamson, Erin. “Portable, Potable Solutions to the World’s Water Crisis.” *International Political Forum*. N.p., 5 Feb. 2013. Web. 15 Aug. 2013.

“Projects.” *Water for Life*. N.p., n.d. Web. 15 Aug. 2013.

“SODIS: How Does It Work?” *SODIS*. Euwag Aquatic Research, 24 May 2011. Web. 15 Aug. 2013.